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AN ENVIRONMENTAL SECURITY INFORMATION
FRAMEWORK FOR
CONTINGENCY OPERATIONS OVERSEAS

by

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Preface

Four years ago, I served as the Base Civil Engineer at Riyadh AB, Kingdom of Saudi Arabia—and was faced with challenging environmental protection issues. Unfortunately, my operational background lacked environmental management experience. Because my future jobs will require more environmental awareness, I chose to research an Environmental Security related topic.

I started with two goals in mind—to improve my knowledge-base and provide a useful product for the field. My initial research, combined with previous deployment experiences, resulted in the perception that existing tools (models and checklists) were too detailed. I knew the environmental issues impacting contingency operations were complex, and wanted to develop an information framework—some way to simplify and present this complexity to deploying commanders. The products are a **model** representing critical factors that impact environmental security and a **checklist** that highlights essential tasks and considerations for commanders deployed to a non-DoD installations overseas.

I sent the model and checklist to Major Command (MAJCOM) civil engineers and environmental experts for their review and comment. Significant improvements were made to both the model and checklist. In summary, their feedback substantially improved both products of this paper, and I sincerely thank those who contributed.

I want to acknowledge the assistance of many people who played an important role in the process of conducting this research. First, the product of this research was clearly improved because of technical and editorial contributions from my research advisor, Maj Bob Fant. Many others contributed as well. For example, Col John Estes challenged me to “fight for feedback”—and contact the MAJCOMs. Other key contributors include: Col Dave Swint, Lt Col Greg Seely, Maj Joe Wilson, Mr. Mike Larson, Mr. Gary Maher, Maj Mark Pohlmeier, Maj Ruben Cruz, Mr. James Baker, Mr. Patrick Atkinson, Maj (S) Dave Crow, and Capt Dean Hitchcock who took valuable time out of their busy schedules to provide input. I thank them all...for they helped me achieve my goals.

Abstract

Environmental Security (ES) is a term coined by Mr.. Gary Vest—he defined it as a principle which seeks to strengthen national security by integrating environmental, safety and health considerations into defense policies. Mission accomplishment is paramount, but so is Environmental Security. How can commanders ensure mission success, protect the health and safety of their personnel, and protect the environment?

To support these goals, this paper proposes an information framework comprised of two elements: 1) the Environmental Security Contingency Operations Model (ESCOM)—represents macro-level environmental security processes and key decision steps and 2) the Commander's Environmental Security Checklist (CESC)—improves the execution of mission requirements. The model and checklist are tools designed to support the deployed commander's decision-making processes.

The information deploying commanders need was developed from a review of relevant literature, then refined, based on feedback from experts in the civil engineering, environmental, and readiness fields. The ESCOM focuses on the context and supports unity of effort. The checklist addresses actions required to effectively train forces, plan for the contingency, and execute mission requirements. It should be integrated with other checklist procedures used by the commander, resulting in mission accomplishment and environmental protection.

Chapter 1

Introduction

Failing to plan is a plan to fail

—Effie Jones

Where will the next Air Force or joint contingency operation be conducted? Will deployed commanders face complex issues to balance—like mission accomplishment and environmental protection? Deployed commanders must resolve complex environmental security issues in order to support operational objectives. The thesis of this report is an information framework can be developed to support overall mission success during contingency operations while protecting the environment.

This report identifies the importance of protecting the environment during contingency operations. The information framework proposed has a narrow scope—it specifically focuses on deployments to overseas, non-DoD installations. Chapter one sets the stage, by identifying the broad national security implications surrounding environmental protection and compliance, then states the problem and presents the methodology used to conduct the research. Chapter two provides fundamental background information necessary to understand the context of Environmental Security. Chapter three presents a proposed model—the Environmental Security Contingency Operations Model (ESCOM); which represents the interrelationships between the

strategic context, full spectrum of conflict, and considerations affecting environmental security. A checklist is also proposed. These two tools, the model and checklist, comprise the "information framework" for deployed commanders. The model and checklist were sent to 15 different experts—at Air Staff, Major Command (MAJCOM), Direct Reporting Unit (DRU) and base levels. Lessons learned from that review are presented in chapter four; then, are followed by implementation strategies and areas of future study.

Environmental Security—What Is It?

Mr. Gary Vest coined the term Environmental Security. It is defined as "a principle which seeks to strengthen national security by integrating environmental, safety and health considerations into defense policies."¹ The US, as a nation, chooses to use its military forces to protect national interests and exert influence around the globe. The result—military leaders will be deployed on contingency operations, which seek to achieve national-level objectives. This chapter introduces why environmental security issues overseas are important (global interdependence) and how the US seeks to achieve national objectives using the military as an instrument of national power (national security strategy).

National-Level Environmental Concerns

Global Interdependence. *A National Security Strategy (NSS) for a New Century* is a report from the President of the United States. The NSS stresses the imperative of engagement—to counter the threats to US national security.² Other sources focus on increasing global awareness of environmental issues ranging from deforestation, to acid

rain, to transportation of hazardous waste.³ The National Defense University says the strategic environment "is far more complex than in earlier years."⁴ Papp refers to environmental protection as a transnational threat and also says:

"There is equally widespread recognition that unprecedented international cooperation will be needed...a certain sense of "global consciousness" may thus be developing, not only on environmental issues, but also terrorism, drugs and other global problems."⁵

The international cooperation, or global interdependence, Papp refers to affects how the national security strategy is shaped.

National Security Strategy. The NSS explains the President's security interests, objectives, and priorities. It suggests maintaining environmental security is an important aspect of our overall national security.⁶ The US national core objectives are: to enhance our security with effective diplomacy and military forces that are ready to fight and win; to bolster America's economic prosperity; and promote democracy abroad.⁷ These objectives protect national interests, and consider the threats to its security.

According to the NSS, the threats are regional or state centered, transnational, and weapons of mass destruction (see chapter two for examples). President Clinton and the National Command Authority (NCA) identified six strategic priorities to meet our national objectives and counter the threats. The fifth strategic priority links environmental protection to national security by stating:

We must continue to move strongly to counter growing dangers to our security: weapons of mass destruction, terrorism, international crime, drugs, illegal arms trafficking and environmental damage...we are protecting the global environment—managing our forests, stopping the spread of toxic chemicals, working to close the ozone layer, reducing the greenhouse gasses that challenge our health as they change our climate.⁸

The NCA clearly states strategic priorities. Examples include: "keep America the world's leading force for peace; increase cooperation in confronting new security threats

that disregard national borders (and unilateral solutions); and strengthen the military and diplomatic tools required to address these challenges.”⁹ The US must have the military and diplomatic tools to meet these challenges.

Other national-level objectives related to environmental security are contained in the National Military Strategy (NMS). The Chairman of the Joint Chiefs of Staff (Chairman) publishes the NMS to ensure commanders and the military forces understand the national military objectives. The Department of Defense also shapes environmental security issues.

The Deputy Undersecretary of Defense for Environmental Security, Sherri Wasserman Goodman, in a recent speech identified the critical role that environmental issues play in protecting our national security. She focussed on global democratization issues and stated the link between taking care of the environment and providing a strong national defense was critical.¹⁰ The North Atlantic Treaty Organization’s (NATO’s) emphasis on environmental protection provides another example of the nation’s concern.

Overseas Theater Environmental Concerns

The US military is also engaged in multinational operations to promote environmental security. For example, the European Command military-to-military program saw Hungarian and US military environmental experts conduct environmental studies before NATO’s Implementation Force (IFOR) used Taszar Air Base to provide logistic support of IFOR operations.¹¹

In a collective security example, the “Committee on Challenges of a Modern Society” shows NATO’s involvement in the “social dimension.” The committee focuses on technology transfer and future conferences in Europe related to military effects on the

environment.¹² These social issues become operational issues when a US military team is deployed overseas. The key issue—accomplishing the mission, while ensuring human health and protecting the environment.

Deployed Commander-Level Issues

What is the best information for a deployed commander to have in order to balance mission accomplishment with environmental compliance? The Navy emphasizes legal issues—understanding environmental regulatory compliance at an overseas installation.¹³

Are technical issues important to the commander? The recently published *Air Force Environmental Handbook for Contingency Operations* (AFEHCO) identifies broad goals, identifies specific technical considerations and underscores the importance of risk management.¹⁴ However, this handbook presents tools that are at too detailed to be useful for a deployed commander. The purpose of this research is to identify the critical environmental issues impacting mission accomplishment.

Problem Statement

The US grand strategy is engagement. Environmental issues are important globally, and nationally. In addition, the NCA has indicated US forces will deploy overseas to project power (using overseas basing) to protect our security interests. Consequently, the commander should have an information framework that keeps the big picture in perspective and focuses their attention on providing environmental security.

During contingency operations, commanders must be able to satisfy mission requirements, ensure life-safety, and protect the environment. Commanders must satisfy

mission requirements and comply with regulatory standards—while operating in a complex context. Therefore, commanders need tools to support decision-making.

Methodology

To fill this need, this study proposes an information framework. This framework is comprised of a model and checklist. The model represents the broad context and interrelationships of its component elements. The checklist provides specific guidelines—useful to mid or senior level officers—to bridge the gap between mission accomplishment (based on expediency, and preserving the safety and health of deployed forces) with critical environmental protection issues. How were these tools developed?

A review of relevant literature was the basis for the information needed by deploying commanders. Then, a model and checklist were developed and sent to headquarters and base-level experts for their review and comment. Appendix A shows the basis for the model. Appendix B indicates who received the information framework. The feedback received from those experts was used to develop the final products (presented in chapter three). The product's potential use in the field is the topic of chapter four.

Expected Results

The two products presented are designed to be used together. The model is foundational. It identifies the big-picture issues and relationships and describes the process of ensuring environmental security during contingency operations. The checklist identifies tasks to be accomplished based on considerations affecting the deployment. The information contained in the model and checklist must support the following broad goals: accomplish the mission; ensure safety and health of deployed personnel (really a

force protection issue); and protect the environment. A review of the literature was the initial basis for that information—and is the subject of the next chapter.

Notes

¹ Phelps, Richard A., Lt Col, *Environmental Law for Department of Defense Installations Overseas*, 3rd ed., March 1997. Pg. 1; on-line, Internet, 12 Nov 1997, available from: <http://denix.cecer.army.mil/denix/DOD/Search/more.cgi>

² *A National Security Strategy for a New Century (NSS)*, The White House: Washington, D.C., 1997, pp. 8-10. Regional dangers, asymmetric challenges, transnational dangers, and "wild card" threats drive the national security strategy.

³ Hughes, Barry. *Continuity and Change in World Politics*. 2nd Ed. Prentice Hall, Englewood Cliffs, NJ. 1994, pp. 12-13.

⁴ Clawson, Patrick L., *Strategic Assessment 1997: Flashpoints and Force Sstructure (FFS)*, National Defense University, pg. xi.

⁵ Papp, Daniel S., *Contemporary International Relations*, 4th ed. (NY: MacMilleam College Publishing Co. 1994), pg. 10.

⁶ NSS, pp. i-iii.

⁷ NSS, pg. i.

⁸ NSS, pg. ii.

⁹ NSS, pg. 29.

¹⁰ Wasserman Goodman, Sherri, *Speech to Army War College*, pg. 1; on-line, Internet, 10 February 1997, available from <http://denix.cecer.army.mil/denix/Public/ES-Programs/Speeches/speech-25.htmlrl>.

¹¹ Tierno, Maria-Elena and Matrai, Eva (Lt Col), "Environmental Security in Hungary," *Military Engineer*, 89:51-52, Oct-Nov 1997, pg 51.

¹² NATO Environmental Web site, *The Challenges of Modern Society (Leaflet Version)*; on-line, Internet, available from <http://echs.ida.org/general/ccms/pub-leaf.html>, Last update: 8 Mar 1996.

¹³ Naval Facilities Engineering Service Center, *Navy Commanding Officer's Guide to Environmental Compliance* (Navy CO Guide), Sep 1995, Pg 5; on-line, Internet, 11 Dec 97, available from: <http://denix.cecer.army.mil/denix/DOD/Search/more.cgi>.

¹⁴ HQ USAF/CEV and AFCESA/CEX, *Air Force Environmental Handbook for Contingency Operations* (AF Env. Handbook), Contract No. F49650-91-D-0008-0101, Aug 1996, pg. 1-2.

Chapter 2

Background and Literature Review

The probability that we may fail in the struggle ought not to deter us from the support of a cause we believe to be just.

—Abraham Lincoln

In chapter one, the concept of global interdependence was introduced. This chapter provides more insight into the nature of the global environment and spectrum of military operations. Environmental compliance guidelines at overseas non-DoD installations are also identified, followed by a summary of guidelines for deployed engineers. Deployed commanders need to understand the legal and technical implications of environmental security issues in order to accomplish their mission while protecting the environment.

The Nature of the Global Environment

The US grand strategy is to use integrated approaches to shape the international environment. The National Security Strategy identifies many techniques to meet that aim. Examples include: using diplomacy, international assistance, arms control, nonproliferation initiatives, and overseas military presence—while maintaining an ability to respond to full spectrum of potential crises and to be prepared today to meet challenges of tomorrow's uncertain future.

The NSS recognizes a simple truth: we must lead abroad if we are to be secure at home, but we cannot lead abroad unless we are strong at home.¹ The national security goal is to ensure the protection of our nation's fundamental and enduring needs: protect the lives and safety of Americans; maintain the sovereignty of the US, with its values, institutions, and territory intact; and provide for the prosperity of the nation and its people.² The threats to US interests are grouped into three, often intertwined categories.

- Regional or state centered threats: some states can threaten vital interests through coercion or cross border aggression. Many are also improving offensive capabilities. In other cases, unstable nations or internal conflicts may destabilize regions where we have clear interests
- Transnational threats: threats that transcend national borders (terrorism, drugs, arms trafficking, organized crime, and environmental damage).
- Threats from weapons of mass destruction: pose greatest potential threat to national security. Reduce threat of existing arsenals and stop proliferation.³

Environmental security-related threats tend to be transnational, because "environmental threats don't heed national borders and can pose long-term dangers to our security and well being."⁴ Therefore, environmental and security concerns are clearly interrelated and shaped by the National Command Authority (NCA).

US National Military Strategy (NMS). The Chairman publishes the NMS to clearly translate the NSS guidance into military objectives. In order to "defend and protect US national interests, our military objectives are to: Promote Peace and Stability, and when necessary, to Defeat Adversaries (sic)."⁵ The elements of that strategy are: "shaping the international environment (US forces shape through deterrence, peacetime engagement activities, and active participation and leadership in alliances); responding to full spectrum crises; and preparing now for an uncertain future."⁶ These elements form the basis for US strategic concepts.

Strategic Concepts. The NMS presents four strategic concepts. They are summarized below, for they govern the use of military forces:

- **Strategic agility:** is the timely concentration, employment and sustainment of US military power anywhere, at our own initiative, and at a speed and tempo that our adversaries cannot match.
- **Overseas presence:** is the visible posture of US forces and infrastructure strategically positioned forward, in and near key regions. Helps promote stability, prevent conflict, and ensure protection of US interests.
- **Power projection:** is the ability to rapidly and effectively deploy and sustain US military power in and from multiple, dispersed locations until conflict resolution. Provides flexibility needed for swift response.
- **Decisive force:** is the commitment of sufficient military power to overwhelm an adversary, establish new military conditions, and achieve a political resolution favorable to US national interests.⁷

Overseas presence and power projection form the conceptual rationale for how the US engages around the world. These four strategic concepts show a reliance on capability-based forces, and underscore the importance of the nation's response to the global environment to meet national strategic objectives.

In addition, several methods of "responding to crises" are prescribed in the current NSS. Responses can be diplomatic, economic, law enforcement or military in nature—or more likely, some combination of them.⁸ In a diplomatic example, the US could work unilaterally or multilaterally to forge agreements protecting the global environment. The military must be able to respond to threats—protecting national vital, core, and humanitarian interests across the full range of conflict.⁹

Spectrum of Military Operations

Contingency operations force commanders to respond to the full spectrum of crises. This continuum extends from Operations Other Than War (OOTW) to fighting and winning Major Theater Wars (MTW). The Chairman stated the military needs to be able

to counter near simultaneous crises in two distant theaters, as well as deter aggression (and coercion) in crises, conduct smaller-scale contingency operations, and fight and win major theater wars.¹⁰

Major Theater War

Major theater warfare represents “the ultimate test of our total force.”¹¹ US forces must be able to deter (in concert with regional allies) and credibly defeat large-scale, cross-border aggression. The US must also be able to “transition to fighting major theater wars from a posture of global engagement—from substantial levels of peacetime engagement overseas as well as multiple concurrent smaller-scale contingencies.”¹² Smaller-scale contingencies (or operations other than war) represent the challenge in the new global environment.

Operations Other Than War (OOTW)

Operations Other than War (OOTW) encompass the full range of military operations short of theater warfare; i.e., humanitarian assistance, peacekeeping, disaster relief, no-fly zones, reinforcing key allies, limited strikes and interventions (see the glossary for definitions). These smaller-scale contingency operations often pose the most frequent challenge for US forces and require close cooperation with other US government agencies and non-governmental organizations (NGOs), regional and international security organizations, and coalition or multinational partners.

Contingency operations generally signal the US commitment to a particular country, or interest, and enhance warfighting capability in the theater. The national deterrence strategy is also important, where the NCA communicates the costs of aggression to an adversary. Consequently, “deterrence straddles the line between shaping the international

environment and responding to crises.”¹³ Figure 1 presents the full spectrum of operations as a continuum.¹⁴ It depicts the relationship between Operations Other Than War and War.

Military Operations	Non-combat		
		Combat	
	Operations Other than War		War
General US Goal	Promote Peace	Deter War & Resolve Conflict	Win
	<ul style="list-style-type: none">• Peacekeeping• Disaster Relief• Nation Assistance• NEO• Civil Support	<ul style="list-style-type: none">• Peace Enforcement• Counter-insurgency• Counter-terrorism• NEO• Strike	<ul style="list-style-type: none">• Large scale Combat• Attack• Defend• Blockade
Examples/ Missions	Spectrum of Required Environmental Security Contingency Operations		

Figure 1. Spectrum of Military Operations

In conclusion, the emerging world system is complex and considered by some to be multi-polar (having more than one center of influence).¹⁵ In addition, the most novel feature is transnational problems—not susceptible to the traditional tools of state craft.¹⁶ Consequently, the military is used to shape the environment. Overseas presence is an important means to that end.

“The DoD has made great strides in integrating environmental stewardship in all its military actions. Despite this emphasis on environmental protection, existing US environmental laws and military regulations do not adequately cover OOTW. As a result, DoD has no strategic environmental policy, either joint or Service, upon which it can base its environmental doctrine in OOTW.”¹⁷

This complexity—combined with increased global awareness and a tendency to deploy the military—highlights the need for environmental stewardship during contingency operations. The *Overseas Environmental Baseline Guidance Document* (OEBGD) prescribes DoD policy,¹⁸ and environmental stewardship often begins with the need to comply with standards and guidelines.

Environmental Compliance Guidelines

Environmental compliance is a legal issue. The unique political, economic, and military issues defining the context complicate the theaters of operations. Lt Col Phelps developed an overview of the political and legal ramifications related to the lack of good stewardship at overseas installations.¹⁹ For continental US (CONUS) operations, environmental compliance is regulated.

However, when considering non-DoD installations, compliance guidance for deploying commanders reflects the peculiar balance of sovereignty inherent in the basing of foreign forces within a host nation (HN).²⁰ For example, DoD Directive 6050.16 established implementing environmental guidance and standards to ensure environmental protection (based on Executive Order (EO) 12088) and mandated the development to the *Overseas Environmental Baseline Guidance Document* (OEBGD).²¹ One interservice law school summarized why compliance is important by stating

“...failure to comply with environmental law can jeopardize current and future operations generate domestic and international criticism, produce costly litigation, and even result in personal liability of both the leader and the individual soldier.”²²

Therefore, the compliance decisions made by the commander should be well advised, and well documented.

Overseas Environmental Compliance and Stewardship

Legal Compliance. According to Lt Col Phelps, executive orders (EO), DoD Directives, and negotiations with the HN define DoD regulatory compliance on non-DoD installations overseas.²³ An Executive Agent (EA) develops Final Governing Standards (FGS) based on the most protective standard (when comparing DoD standards in OEBGD versus HN standards). If a non-DoD installation did not have an EA assigned, the situation becomes much more complicated. Figure 2 shows the hierarchy for overseas installations.²⁴ Knowing what standard applies is critically important.

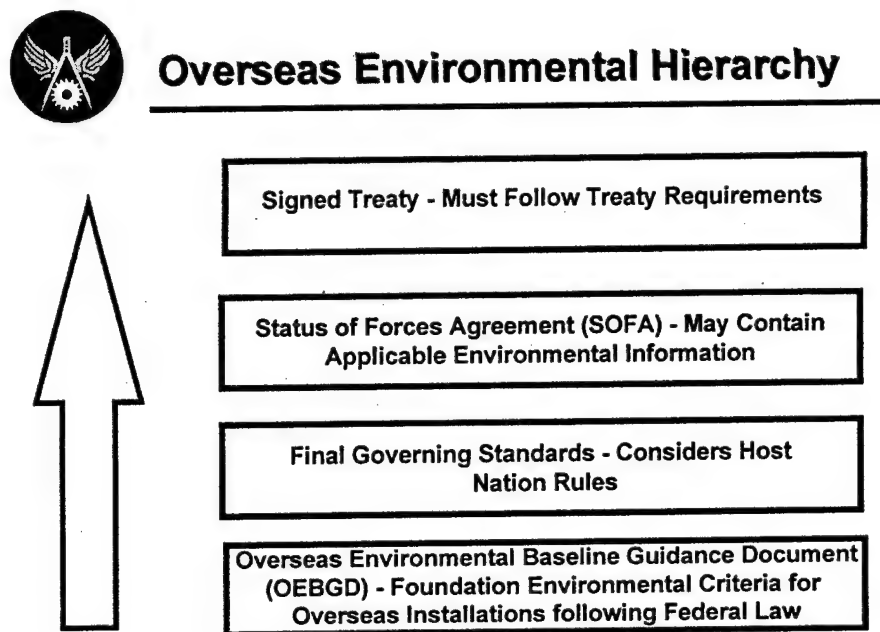


Figure 2. Hierarchy of Overseas Compliance

The Navy Commander's guide recommends deployed commanders work with the theater civil engineering (and legal) component to determine which standards apply. A recent operational example of a legal review in the European theater exemplifies the complexity involved:

“...Bosnia and “other former warring faction” nations were “participating nations” under the provisions of [EO 12114] and that there was no need to go through all the exemption hoops. Instead, lawyers supporting operations Joint Endeavor and Joint Guard have been executing the general environmental steward mandate by referring to the Germany OEBGD as a guide in Bosnia to the extent that doing so does not unacceptably interfere with operations, especially force protection.”²⁵

Stewardship. The theme at a conference in Berlin, Germany last year was cradle to grave implementation of “tools” available for the cleanup of military sites in Europe. In Mr. Vest’s presentation, he discussed environmental stewardship (past, present and future) and characterized the importance of environmental issues to the strategic environment by saying “think about how significant these activities (developing environmental-based relationships) are to environmental cooperation, and understanding stability which leads to the absence of conflict.”²⁶ We attempt to stabilize our approach to environmental security by developing and implementing standards. The OEBGD contains our current implementation guidance, procedures, and criteria at DoD installations overseas,²⁷ so what are our policies and procedures at non-DoD installations?

Non-DoD Installation Environmental Standards

For military environmental and civil engineers, their experiences, training and education provide a baseline for planning and action. Usually guidelines are published in the form of joint doctrine, service-unique pamphlets or instructions, and best management practices (BMP). From a contingency operations perspective, there is a gap. Of the three AF instructions governing Civil Engineer readiness program management, only the Rapid Engineer Deployable Heavy Operation Repair Squadron Engineer (RED HORSE) guidance considers environmental protection in the planning process.²⁸

The Air Force took a considerable step to correct this by publishing a contingency guide—the *Air Force Environmental Handbook for Contingency Operations* (AFEHCO). It states “factors affecting environmental compliance include length of deployment, time restraints, location of operation, and the purpose of the operation.”²⁹ This handbook also introduces risk management matrices, which are useful tools for identifying sensitive environmental areas by identifying hazards, using task analysis, and hazard control before and during contingency operations.”³⁰ Risk and vulnerability assessments are one of the commander’s most challenging tasks.

Risk Management

Risk management is a “systematic way to identify hazards and select control measures that don’t rely simply on intuition and experience.”³¹ Examples of control measures are BMP developed over time, many of which are codified in the OEBGD. “The objective is full environmental compliance exercises and deployments.”³² Table 1 shows a sample risk analysis, where the environmental “area” and “task” organize the matrix. The Commander and his/her staff would identify the applicable environmental areas of concern, and expected tasks for a specific deployment. Then, the risk for each area would be assessed, using 5 (as high risk) through 0 (as no perceived risk) scale. A matrix such as this should be used to identify expectations, then to track and monitor actual performance throughout the contingency.

Summary of the Literature—Putting It All Together

Deploying commanders must know and document the decision-criteria that determine which standards will apply during and after contingency operations.

Compliance is a function of the location (DoD vs. non-DoD) and the nature of the contingency.

If an EA was designated and has established FGS—follow them. If a FGS does not exist, use the OEBGD. The US Navy's guidelines for commanders emphasize determining which standard applies to a deployment, and making sure the commander (or deployed engineer) has a copy of the standard.³³ Because the global environment is important, and complex, it should be analyzed. The commander must dovetail environmental security considerations into their overall plan to improve mission accomplishment and reduce risk. Chapter three explores what information is needed to effectively plan and execute the mission.

Table 1. Risk Management Matrix

Environmental Area	Task							Risk rating
	Site Preparation	Power prod. and elect distribution	Water treatment and distribution	Facility construction	Aircraft maintenance /refueling	Vehicle equipment maintenance	Other industrial operations	
Air Pollution	1	2	0	0	1	1	0	5
Water Pollution	5	2	4	2	3	2	0	18
Noise Pollution	3	1	0	3	1	3	0	11
Hazardous Materials/Waste	1	1	2	1	1	1	0	7
Cultural Resources	0	0	0	0	0	0	0	0
Natural Resources	0	0	0	0	0	0	0	0
Wetland Protection	5	2	2	2	2	2	2	15
Overall Rating								56

Source: Air Force Environmental Handbook for Contingency Operations, (HQ USAF/CEV and AFCESA/CEX, August 1996), pg. 8-8.

Notes

¹ NSS, pg. 1.

Notes

- ² NSS, pg. 5.
- ³ NSS, pp. 5-6.
- ⁴ NSS, pg. 11.
- ⁵ *National Military Strategy of the United States of America, Shape, Respond, Prepare Now: A Military Strategy for a New Era (NMS)*, 1997, pg. 2.
- ⁶ NMS, pp. 2-3.
- ⁷ NMS, pg. 3.
- ⁸ NSS, pg. 9.
- ⁹ NMS, pg. 6.
- ¹⁰ NMS, pg. 15.
- ¹¹ NSS, pg. 12.
- ¹² NMS, pg. 12.
- ¹³ NSS, pg. 11.
- ¹⁴ Bolling, Robert H., *The Joint Theater Level Simulation in Military Operations other than War*, Joint Warfighting Center, Aug 95, pg. 3.
- ¹⁵ F&FS, pg. 1.
- ¹⁶ F&FS, pg. 2.
- ¹⁷ Carr, David L., Colonel, *Considerations for the Development of a DoD Environmental Policy for Operations Other Than War*, May 1997, pg. 2; on-line, Internet, 10 October 1997, available from: <http://aipi.gatech.edu/pubs/carr>.
- ¹⁸ DoD directive 6050.16, mandated the development of the OEBGD.
- ¹⁹ Phelps, n.p.
- ²⁰ Phelps, pg. 2.
- ²¹ Phelps, note 142.
- ²² *Operational Law Handbook*, International and Operational Law Department, (VA: The Judge Advocate General School, US Army, JA422, 1997), Pg. 5-1.
- ²³ Phelps, pg. 2.
- ²⁴ Powerpoint presentation sent via EMAIL by Mr. Mike Larson HQ AF/ILEVQ, 3 March 1998, pg. 1.
- ²⁵ *Operational Law Handbook*, pg. 5-2.
- ²⁶ Military to Military Environmental Conference, *Abstracts of Speaker Presentations*, 12-16 May 1997, pg. 2; on-line, Internet, 12 Nov 97, available from DENIX home page, <http://denix.cecer.army.mil/denix>.
- ²⁷ *Overseas Environmental Baseline Guidance Document*, 1992, n.p.; on-line, Internet, available from DENIX home page, <http://denix.cecer.army.mil/denix>.
- ²⁸ Based on a review of AFI 10-209 RED HORSE Program, 20 Apr 94; AFI 10-210 PRIME BEEF Program, 6 Apr 94; and AFI 10-21 Base Civil Engineer Contingency Response Planning, 30 Mar 94.
- ²⁹ AF Env. Handbook, pg. 7-1.
- ³⁰ AF Env. Handbook, pg. 8-1.
- ³¹ *Organizational Risk Management (ORM)*, Automated learning program, CSAF directed training, 3 Jan 98, Based on AFI 91-213 ORM Program, n.p.
- ³² AF Env. Handbook, pg. 8-1.
- ³³ *Navy CO Guide*, pg. 5.

Chapter 3

Proposed Information Framework

Knowing is not enough; we must apply. Willing is not enough; we must do.

—Johann Wolfgang von Goethe

Chapter one set the stage for the information framework presented in this paper by showing the importance of environmental security issues. Chapter two went a step further by characterizing the global environment and its interdependent relationships, while identifying important legal issues. In short, deployed commanders don't always benefit from clear regulatory guidance or "overseas environmental law."¹ To understand environmental issues impacting contingency operations, the commander must understand the broad strategic context, and how their contingency operation impacts, and is impacted by, the context.

This chapter proposes an information framework—comprised of a model and checklist. The model represents the overarching context—offering a simplified representation of the variables that impact environmental security (Figure 3). The checklist is designed to improve contingency mission planning and execution by focusing on the execution stage of the contingency operation.

The information framework was developed based on the literature—then refined based on feedback from experts in the field. Background information (figures and

glossary of terms), the original model, and original checklist are shown in Appendix A. Appendix B lists the experts. This chapter presents the final product. The model and checklist are tools designed to support the deployed commander's decision-making process. Here is the model representing the complex situation.

The Environmental Security Contingency Operations Model (ESCOM)

The goal is to provide a product useful to mid or senior-level deployed commanders—to bridge the gap between mission accomplishment and critical environmental protection issues. The ESCOM (Figure 3) presents macro-level factors, starting with the contextual elements that define the global environment and ending with the achievement of a desired end state. Terminology specific to the model is presented in Appendix A—other military terms are in the glossary. Basic concepts follow.

Basic Concepts and Relationships

The trigger event is the event, or series of events instigating the deployment. Contingency operations evolve within a context that can be described using six contextual elements (elements which affect military operations, but are usually beyond the control of the commander).² For a given scenario, the NCA defines strategic objectives, then the combat commander (commander in chief) develops supporting military objectives. Well-developed objectives and clearly defined commander's intent provide the basis for good planning and execution to occur. The objectives and context affect the selection of our course of action (COA)—also known as major military options.

The course of action could be compliance-based, or noncompliance-based. The commander's subsequent execution strategy is based on environmental considerations

Contextual Environment

- Political
- International
- Economics
- Leadership
- Sociocultural
- Environment

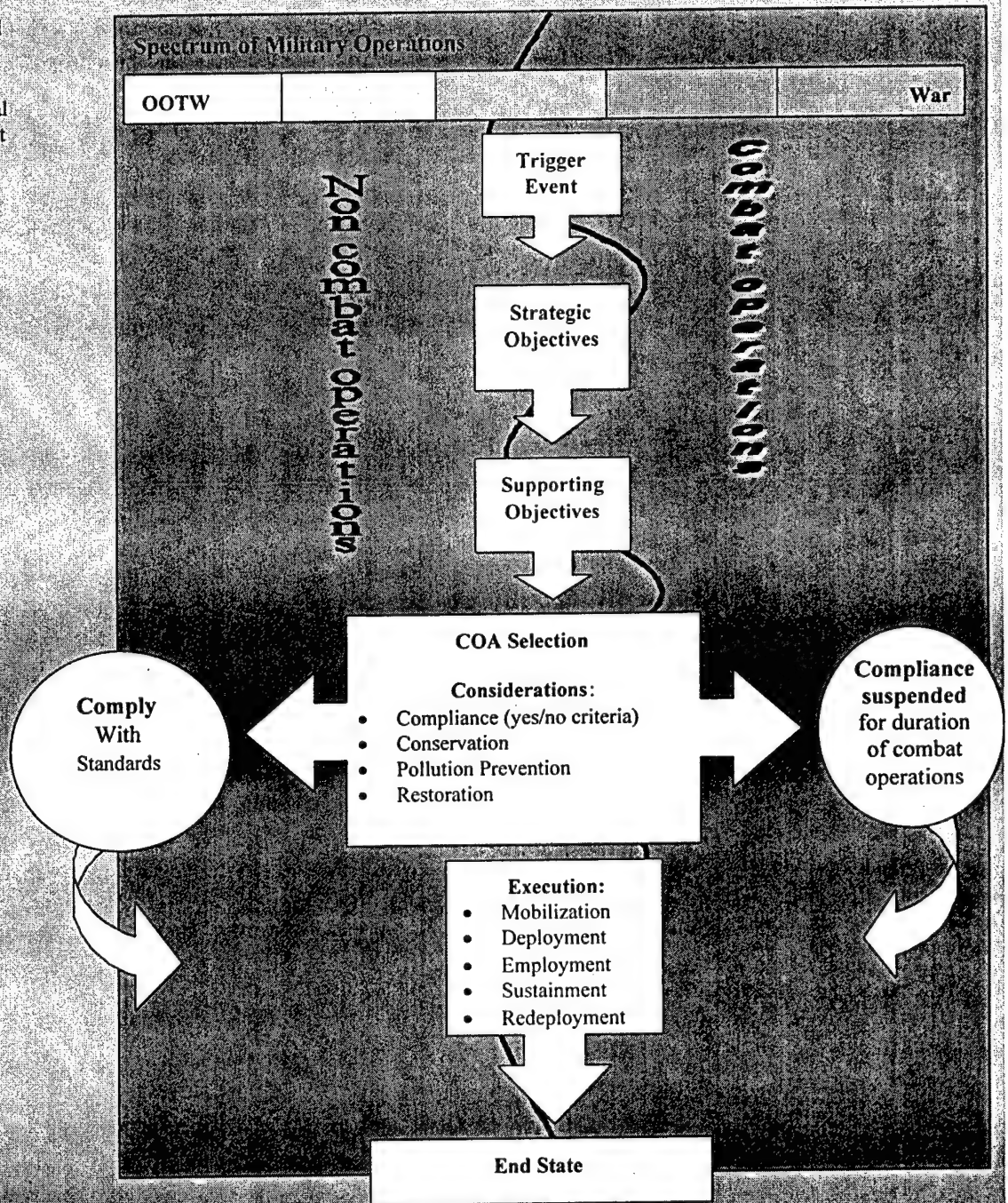


Figure 3. Environmental Security Contingency Operations Model (ESCOM)

shown—which depict the four stated goals from the *Air Force Environmental Handbook for Contingency Operations*.³

- **Compliance:** meeting all environmental standards applicable to present operations.
- **Conservation:** planning future use activities to minimize environmental impacts, and managing responsibly the irreplaceable natural and cultural resources it holds in public trust.
- **Pollution Prevention (P2):** eliminating pollution from its activities wherever possible through recycling and reuse.
- **Restoration:** cleaning up environmental damage caused by contingency operations.

This underscores the importance of proactive, up-front management in all four areas.

Course of Action Development

The commander must accomplish the mission, while ensuring safety and health of deployed personnel and protecting the environment through compliance, conservation, P2, and restoration. Determining the applicable standards and level of compliance are critical decision-points. The revised model is shown in two forms. The first (Figure 3) shows only the essential terms and relationships. The second (Figure 4) overlays dialogue boxes to remind the user of important guidelines related to deciding what standards and level of compliance are required in a given scenario. The dialogue boxes depict compliance guidelines related to executing a course of action.⁴

For instance, compliance requirements at non-DoD installations may be defined in a signed treaty, which must be followed. If there's no treaty, a Status of Forces Agreement (SOFA) may contain applicable environmental information. The next issue to consider—are host nation rules defined in a Final Governing Standard (FGS)? If there was no treaty, SOFA, or FGS, then follow the foundational document for environmental criteria overseas—the OEBGD. However, the context and spectrum of conflict (whether or not the contingency is combat or non-combat) are also critical.

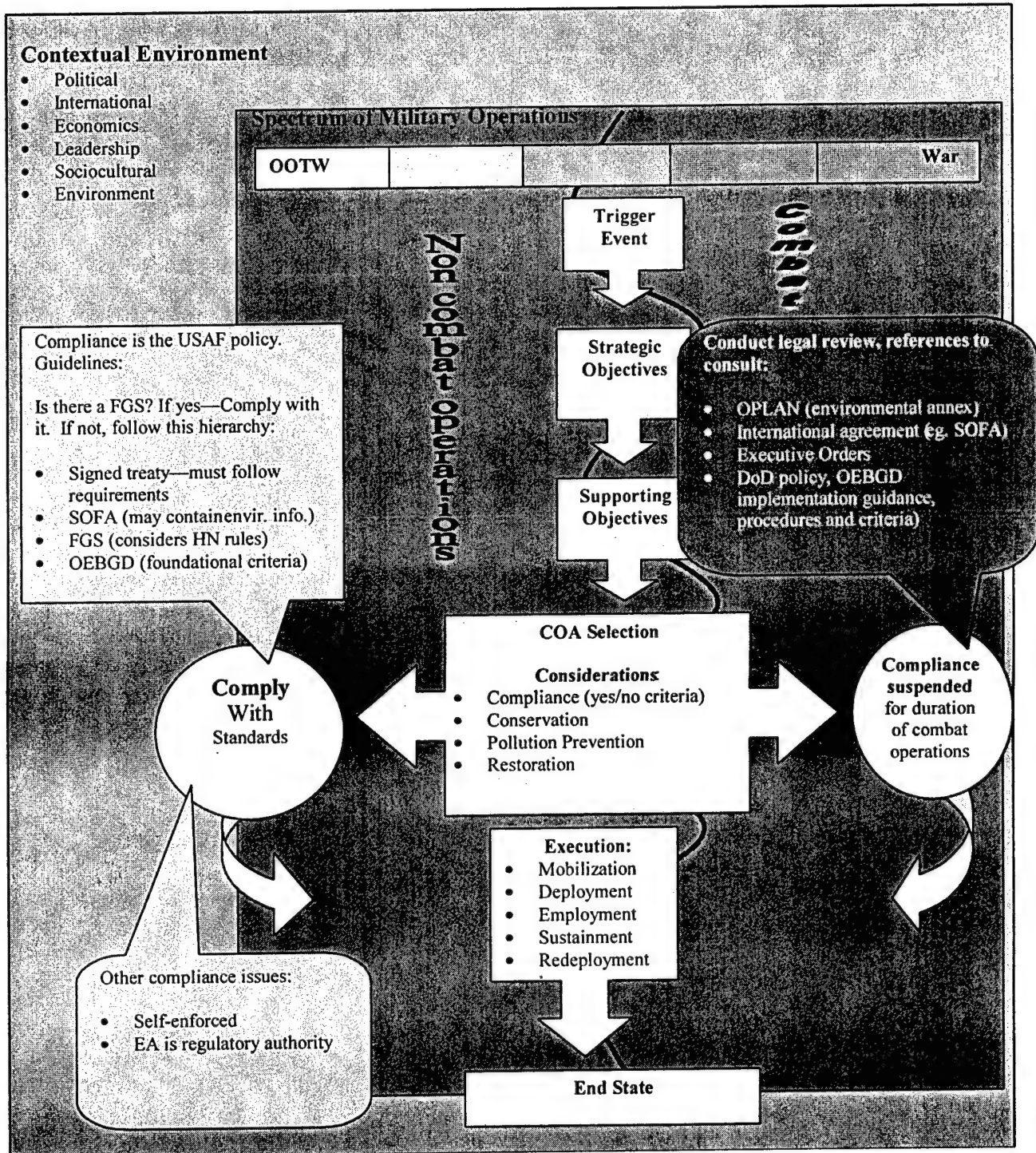


Figure 4. ESCOM with Dialogue Boxes

Final Governing Standards and OEBGD criteria may not apply to actual or threatened hostilities, operational deployments, peacekeeping missions, NEO, or

humanitarian relief operations.⁵ The following example shows how the context and spectrum of conflict affect the level of compliance. One overseas component developed a matrix to relate the level of compliance to the threat of hostilities. As the threat increases, the level of compliance decreases. The ESCOM also shows how the spectrum of conflict affects compliance. It depicts this by linking non-combat operations with compliance—whereas compliance could be suspended during combat operations. The dialog box addressing combat operations highlights the importance of conducting a legal review. Ultimately, the commander's decision regarding compliance will significantly affect how they conduct (execute) the operation.

Executing a Course of Action—the Checklist

Contingency operations are conducted in five distinct stages: mobilization; deployment; employment (beddown); sustainment; and re-deployment.⁶ The Commander's Environmental Security Checklist (CESC) shows specific tasks that are applicable to each stage and considerations critical to each task (Table 2). In reality, the checklist is a planning and execution tool. The checklist is based on a combination of legal and technical decision criteria.

However, individual commanders must identify what information and actions are critical to the success of their mission, based on the contextual environment and spectrum of conflict. This is consistent with the concept of commander's intent, which embodies both the purposes of the operation and desired end state.⁷ Strategic objectives and commander's intent constrain initial planning. The commander's vision of the end state frames the execution strategy and significantly affects subsequent employment, sustainment and redeployment decisions.

Table 2. Commander's Environmental Security Checklist

Applicable Stage:					Task	Considerations
Mobilization	Deployment	Employment	Sustainment	Redeployment		
					Note: gray shading indicates which stage of execution applies to this task	
	Plan		Implement	Implement/Monitor	Work with Deployed CE/Theater Component to identify environmental issues based on: <ul style="list-style-type: none"> Situational awareness—determine context, mission requirements, and spectrum of conflict Legal/political issues: ID governing standards and HN or international agreements in AOR Develop AOR-specific BMP (to ensure human health and environmental protection) 	Critical step—determine mission requirements, legal considerations and situation-unique deployment issues <ul style="list-style-type: none"> Document logic trail Consider capabilities and limitations Consider context Identify post-action risk, based on the environmental situation
	Plan	Plan and execute	Implement	Monitor	Consider Elements of Environmental Planning (reference JP 4-04): <ul style="list-style-type: none"> Policies and responsibilities to protect and preserve the environment during the deployment Certification of local water sources by appropriate medical field units Solid and liquid waste management Hazardous material management including the potential use of pesticides Flora and fauna protection Archeological and historical preservation Base field spill plan 	Obtain AOR-specific information. Waste Management issues include (ref JP 4-04): <ul style="list-style-type: none"> Open dumping? Open burning? Disposal of gray water? Disposal of pesticides? Disposal of human waste? Disposal of hazardous waste? The plan must be executed—develop training procedures and execution strategy based on these general planning categories
					Consider legal issues at the non-DoD installation: <ul style="list-style-type: none"> ID req. for compliance, conservation, P2, and restoration Photos (or video)—document environmental conditions before, during and after deployment 	If OPLAN Environmental Annex exists—comply with guidance. Is there a FGS? If not, use the OEBGD and document decision process. Stewardship—if compliance is not mandated, use common sense and implement BMP
	ID		Impl		Identify training requirements and implement <ul style="list-style-type: none"> US forces Host nation or coalition forces 	Consider multinational, Joint, or service-unique requirements.
					Develop risk assessment and plan to manage risk	See Chpt. 8, AF Envir. Handbook for Cont. Ops
	Develop	Implement		Lessons Learned	Stewardship—develop and implement BMP for each specific category: <ul style="list-style-type: none"> Hazardous waste and hazardous material Solid Waste Water (availability, quality, storage, distribution) Spill Prevention Program Air Pollution Natural and Cultural Resource Management Pollution Prevention and Conservation Pesticide (control, use, disposal...) 	<ul style="list-style-type: none"> Determine standards based on legal compliance (OPLAN, FGS or OEBGD), or BMP. Are you deploying with organic capability to manage these issues? If not, who are you relying on and what capabilities (and limitations) do they have? Focus: minimize impacts to human health and the environment without impacting the mission
					Update Environmental Plan (in OPLAN or OPORD)	Document lessons learned

End State—Environmental Issues and Redeployment

Joint Pub 1-02 defines end state as “what the NCA wants the situation to be when operations conclude...the set of required conditions that achieve the strategic objectives.”⁸ From an environmental security perspective, DoD policy states we must integrate environmental considerations into defense policies to ensure we protect the environment during military operations.⁹ Deployed commanders must work closely with the theater component, or civil engineer unit supporting the deployment to determine the compliance-level required.

This information shapes the training, resources, and capabilities required—meeting mission requirements and providing environmental protection. However, even in a “non-compliance” execution context, the commander should implement best management practices (BMP) during the contingency—in order to preserve safety and health, and to minimize negative impact to the environment.

Environmental stewardship maximizes effectiveness and minimizes risk to deployed personnel. Stewardship also helps mitigate future conflicts. For example, hazardous waste left behind may contaminate drinking water. Considering stewardship directly supports an end state consistent with national strategic objectives and will ultimately protect personnel’s health and the environment.

Clear national objectives, supported by the commander’s vision (expressed as commander’s intent) and the global context impacting the deployment will shape the execution strategy under consideration. Compliance, and the need for environmental stewardship, drives execution standards commanders should follow. The model depicts the overarching context and significant considerations. Commanders should dovetail

mission requirements with environmental security considerations—based on developing and executing a plan that encourages stewardship and supports conflict resolution.

Summary

The information framework presents macro-level issues a deployed commander should understand. The ESCOM emphasizes the relationship between the contextual elements and military operations. The model emphasizes either compliance or suspended-compliance execution strategies may be developed, based on legal, political, and spectrum-of-conflict considerations. The checklist further delineates the execution aspect of the model by identifying what general and specific tasks to accomplish—beginning with the planning stage, and ending with the redeployment of personnel. These two tools (model and checklist) were improved by comments from the field. The next chapter summarizes the feedback received from those experts.

Notes

¹ Phelps, pg. 2.

² Weaver, Larry A. and Pollock, Ribert D., *Campaign Planning for the 21st Century: an Effect-Based Approach to the Planning Process*, Reprinted in War Theory Coursebook, September 1997, pg. 41.

³ AF Env. Handbook, pg. 1-3.

⁴ Legal perspective gained from two sources: Phelps (supra) and *Operational Law Handbook*.

⁵ OEBGD, 1992, preamble.

⁶ Joint pubs identify these five stages. The AFEHCO uses more civil engineering specific stages (predeployment, initial beddown, sustainment, and redeployment), pp.1-1 to 1-2. Joint “stage” terminology was chosen for consistency to link with broader planning issues the commander faces.

⁷ Joint Pub (JP) 5-0, Doctrine for Planning Joint Operations, Office of the Chairman, Joint Chiefs of Staff, pp. II-16-19.

⁸ JP 1-02, *DOD Dictionary of Military and Associated Terms*, March 1994, n.p.

⁹ Phelps, pg. 4, based on review of EO 12088 and DoD 6050.16.

Chapter 4

Feedback and Conclusions

Life is the art of drawing sufficient conclusions from insufficient premises.

—Samuel Butler

The model and checklist presented in chapter three were sent to 15 experts in order to improve the information framework. The experts represent a mixture of practitioners and educators. Those in “practice” are either commanders, or on headquarters-level environmental staffs. Educators are either current or former professors, with advanced degrees in Civil or Environmental Engineering. Appendix B shows who received the initial information framework (the package sent contained a brief narrative description, the model, and checklist). Ten people provided feedback. This chapter summarizes that feedback (in non-attribution format) and offers concluding comments.

General Feedback

All respondents thought the model and checklist were a good idea, but some challenged how to apply the tool. For example, “philosophical feedback” argued the checklist not be a separate tool for commanders, but should be integrated as part of a single checklist. The advantage of integrating the checklist would be to establish environmental security issues as part of what the commander must consider—on equal footing with other planning and execution considerations, such as force protection.

Commanders must seamlessly integrate environmental security considerations to guarantee short-term mission objectives are met and long-term global relationships are preserved.

In two other comments received from two different geographic theaters of operation (overseas) both respondents noted the difficulty of setting up FGS, or using the OEBGD. These standards were considered more applicable for long-term presence, whereas the commander's emphasis in planning should be in ensuring environmental guidelines are published before the deployment. These guidelines normally appear in annexes to the Operations Plan (OPLAN) or the Operations Order (OPORD). The advantage of having environmental standards published as part of the official plan, or order, is clear—the information is accessible and unambiguous.

Ambiguity was another problem noted by one of the reviewers. The hierarchy of different standards was presented in Figure 2, indicating what standards should take precedence, and a deployed commander validated this. However, although the legal guidelines were applied as noted in the literature, the commander commented “this is a huge nightmare, because different elements will interpret the guidance differently,” indicating how complex the legal issue can become. Non-compliance in this case is compounded by the fact that there is no SOFA in this particular country. Therefore, signing treaties that clearly address environmental issues (to address long-term forward presence) or providing clear guidance as part of the published plan, or order, is imperative.

Another general comment from the overseas theater was to emphasize accomplishing a baseline survey in the checklist. This survey helps protect the deployed commander

and US government from potential claims (during the deployment, or after redeployment).

Technical and Procedural Recommendations for the Checklist

The checklist was also modified to depict more consistent language (when transitioning from the model to the checklist). References were added to the “considerations” column, and descriptive notes were added to amplify what task is done during each stage within a specific task. The references show a member of the commander’s staff the basis for that area of concern (or action).

Summary of Feedback

Feedback from overseas theaters of operation affirmed that the biggest challenge is often identifying which compliance standard applies to a given deployment. Then, the limiting factor isn’t knowing what to do, or lack of training on how to protect the environment, but having the resources (money) to conduct the detailed studies or comply fully with a prudent level of environmental security-related protection.

This chapter also summarizes the paper by offering suggestions on how to implement the environmental security information framework and presents areas of future study.

Suggested Implementation

One suggestion from the European theater of operations was a recommendation on how to implement the checklist. The comment—work with the Air Force Institute of Technology (AFIT) to include it in their Contingency Engineer Commander Course. This would institutionalize it within the Air Force civil engineering community.

The other suggestion came by way of an example. In countries where they have an EA, and a FGS, they include environmental management concerns of a contingency operation under normal base operations. Both ideas would support integrating environmental security concerns holistically—as opposed to a piecemeal approach.

Making systemic changes supporting environmental security within the theater of operations is critically important. Two techniques could support this: 1) include environmental protection as part of the Joint Training System, where CINCs tailor their specific training needs to the theater of operation; and 2) ensure environmental annexes are completed for every operations plan. What else can be done?

Areas of Future Study and Testing

The information system presented in this paper must be used, in order to determine the best way to incorporate it into new or existing checklists. Conducting a case study would be a good “academic” way to approach this. Another, more hands-on, approach would be to use the tools for an exercise or contingency operation, then document lessons learned and modify the tool as needed. Both approaches are valid; this author prefers a hands-on approach.

Summary

Chapter one and two set the stage by identifying the strategic and operational validity of environmental security issues—and linked environmental protection to overall mission accomplishment. Chapter three identified two new tools—the ESCOM and CESC—useful to improve the commander’s ability to identify and resolve environmental security

issues. This chapter presented refinements to the model and identified areas of future study.

Executing the mission is always paramount in the commander's mind—just as ensuring the safety and health of deployed personnel is considered a force protection issue. As a result, commanders are already addressing sanitation and occupational safety-related issues. Synergy will result, when deployed commanders embrace environmental security as a critical (and normal) aspect of every contingency operation, resulting in mission accomplishment and environmental stewardship.

Appendix A

Background...Original Model and Checklist

This appendix contains background information on the Air Command and Staff College *Conflict Resolution Process Model* presented in the Conflict Resolution Course. The conceptual basis of this model shaped the Environmental Security Contingency Operations Model (ESCOM), presented in this paper (see chapter three). The background information is presented, then the ESCOM and checklist are shown in their original form.

Conflict Resolution Process Model

The *Conflict Resolution Process Model* (CRPM) was presented at Air Command and Staff College to show the relationship between a trigger event and ultimate end state. The campaign planning process was emphasized, with specific focus on how strategic and supporting objectives are translated into executable course(s) of action (COA) to provide unity of effort. The end state is a function of: the manner in which the war is executed; the level of congruence in objectives; and how well the whole process integrates with (and is determined, or shaped by) the contextual elements and facets of the operational art. The CRPM is shown as Figure 5. A detailed explanation of the terms used, and relationships represented in the model are contained here.

This model was chosen as a baseline for the ESCOM because it shows the relationship between mission objectives and execution, as well as the importance of the context. The notion of contextual elements is expanded in the proposed model to include the spectrum of conflict, ranging from Operations other than War (OOTW) to war.

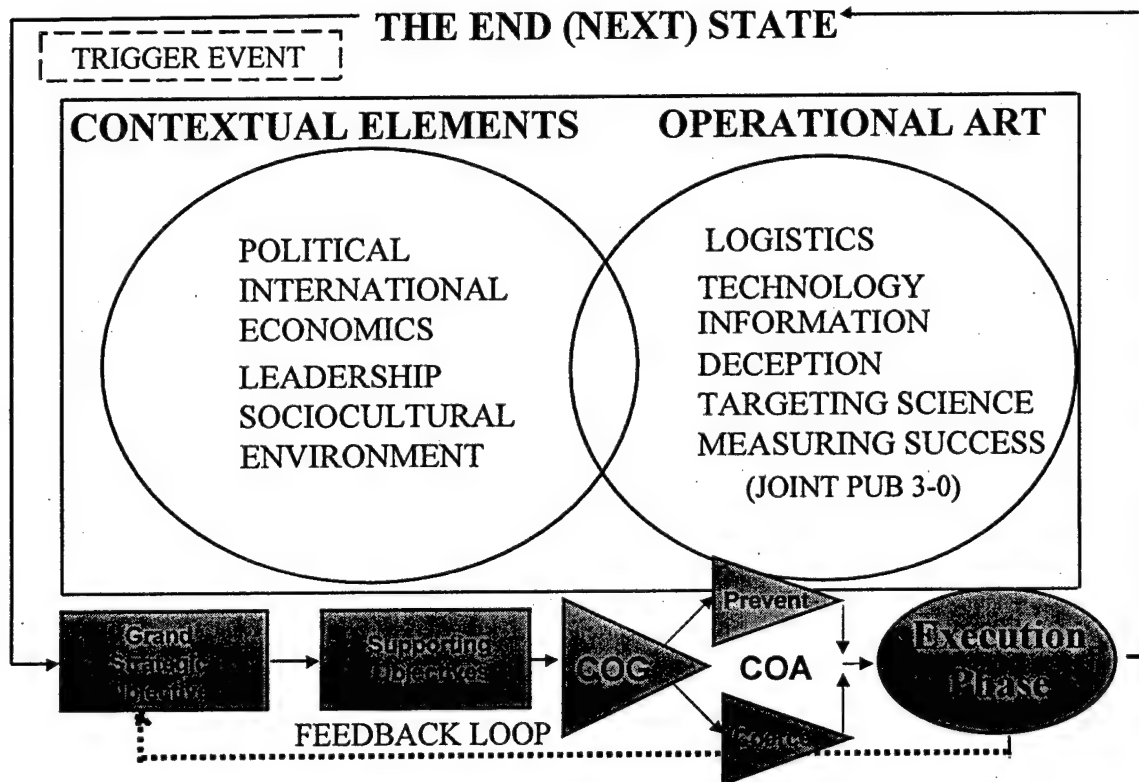


Figure 5. *Conflict Resolution Process Model*

Source: Air Command and Staff College Conflict Resolution Course, Jan 98

Conflict Resolution Process Model Glossary of Terms

Trigger Event. An event that begins the process of determining a desired end state. This event can take the form of many different things (e.g., the CNN factor triggering US involvement in Somalia)

Strategic Objective(s). "Actions planned to reach the desired end state" (ACSC Conflict Resolution Toolkit). "Planning for employment...begins with the articulating and understanding the objective, purpose of the operations, and commander's intent." (JP 3-0) It is the responsibility of the war fighting CINC to refine the guidance given by the NCA and provide direction to the subordinate JFC. Once receiving this guidance, the JFC translates the theater strategy into attainable objectives that are clearly defined. Strategic objectives may be accomplished using any or all of the

instruments of national power (IOPs). "Often, combat commanders may be required to support the other instruments of national power as directed by national and multinational leadership." (JP 3-0) NCA, NSC, Ambassadors define, or developed through an Interagency Process. Satisfying these objectives should allow you to reach the desired end state.

Supporting Objective. Possible military supporting roles include: nation assistance, security assistance, humanitarian operations, peacekeeping, sanctions enforcement, and peace enforcement. Other strategies include: humanitarian aid, resettlement of refugees, the development of democratic and governmental institutions, reform of military and law enforcement institutions, and economic reconstruction." (Toolbook)

Courses of Action (COA). (Campaign Planning) - "Selecting COAs is a decision making process from which commanders produce the major military options. COAs can be differentiated by varying the number of combat forces, geographic areas, or phases (timing). Each course of action should consider enemy and friendly COGs." (Toolbook)

Military Objectives. Define what is to be accomplished through the various IOPs to accomplish the grand strategic objective. These supporting elements must be congruent with the strategic objectives and are derived with the help of the six contextual elements. (Toolbook)

Centers of Gravity (COG). "...the hub of all power and movement, on which everything depends" and "the point against which all energies should be directed." (Clausewitz) The COG concept is as useful as an analytical tool while designing campaigns and operations to assist commanders and staffs in analyzing friendly and belligerent sources of strength as well as weaknesses and vulnerabilities. Analysis of COGs is a continuous process throughout an operation. Identification of COGs requires detailed knowledge and understanding of how the conflict parties organize, fight, make decisions, and their psychological strengths and weaknesses. It is important to identify friendly COGs so they can be protected. (Toolbook)

Execution Phase. This planning process has one major output: an operational plan (OPLAN) or an operation order (OPORD). The campaign plan is essential for linking the mission to the desired end state. Essential considerations include: Terms of Reference (TOR), analyzing the mission, and Rules of Engagement (ROE). A concept for transition and termination is essential to the campaign plan. Planners should consider the media, nongovernmental organizations (NGOs), private volunteer organizations (PVOs), and coalition partners and allies as primary players.

End State. "involves returning to a state of peace...may include...diplomatic, economic, informational, and military conditions" "defining the end state and ensuring it supports achieving national objectives are the critical first steps in the estimate and planning process." (JP 3-0) Or "a grand strategic vision achieved by the fulfillment of politico-military objectives and defined in terms of all IOPs, geographically and duration." (Ralph Millsap, CR 500)

Information. Challenging area due to the proliferation of data available. It is essential that commanders clearly specify their intelligence requirements and tailor their reports to address those specific requirements. Only in this way can we avoid

- paralysis brought on by information overload, and exploit enemy vulnerabilities while minimizing our weaknesses. (Toolbook)
- Logistics.** "...the glue of armies and societies." Planning must consider strengths and vulnerabilities in ourselves and the enemy." (e.g., equipment, ships, planes, tanks, weapons, spares, material, training, transportation, communication, etc.) Logistics can also consider factories, laboratories, workers, farmers, and scientists. (Toolbook)
- Deception.** "must be integrated into the planning process during its earliest stages." (Toolbook)
- Measuring Success.** "knowing when you have met your military objectives. It requires planners not only know what effects they wish to induce, but that they establish specific criteria to measure for those effects." (Toolbook)
- Targeting Science.** "...the heart of Operational Art." Successful targeting is no longer measured by how much damage is wrought, but rather intended effects are achieved. This requires we determine beforehand what effects we are seeking: Strategic (leadership), Operational (enemy fielded forces), Psychological (enemy will), or any combination above. (Toolbook)
- Technology.** "...not limited to technological advancement, but also includes identifying military applications for new technologies and making necessary changes to military doctrine and organizational structures." (e.g., computer systems collecting and exploiting data). (Toolbook)

Original Information Framework

The original model (ESCOM) is shown as Figure 6. The final model contains the same basic terms and relationships. Figure 6 shows the version of the model sent to the civil and environmental engineering experts for feedback. Minor refinements were made to the course of action and execution areas. Modifications were made to add clarity to the issue of selecting a course of action. Refer to chapter three for key terms and relationships.

The original checklist (CESC) is presented as Table 3. This is the checklist that was included in the information sent to the experts. Refer to chapter three for a description of how the checklist interfaces with the ESCOM. Chapter four summarizes changes made to both tools. A listing of the experts who reviewed the model and checklist is shown in Appendix B.

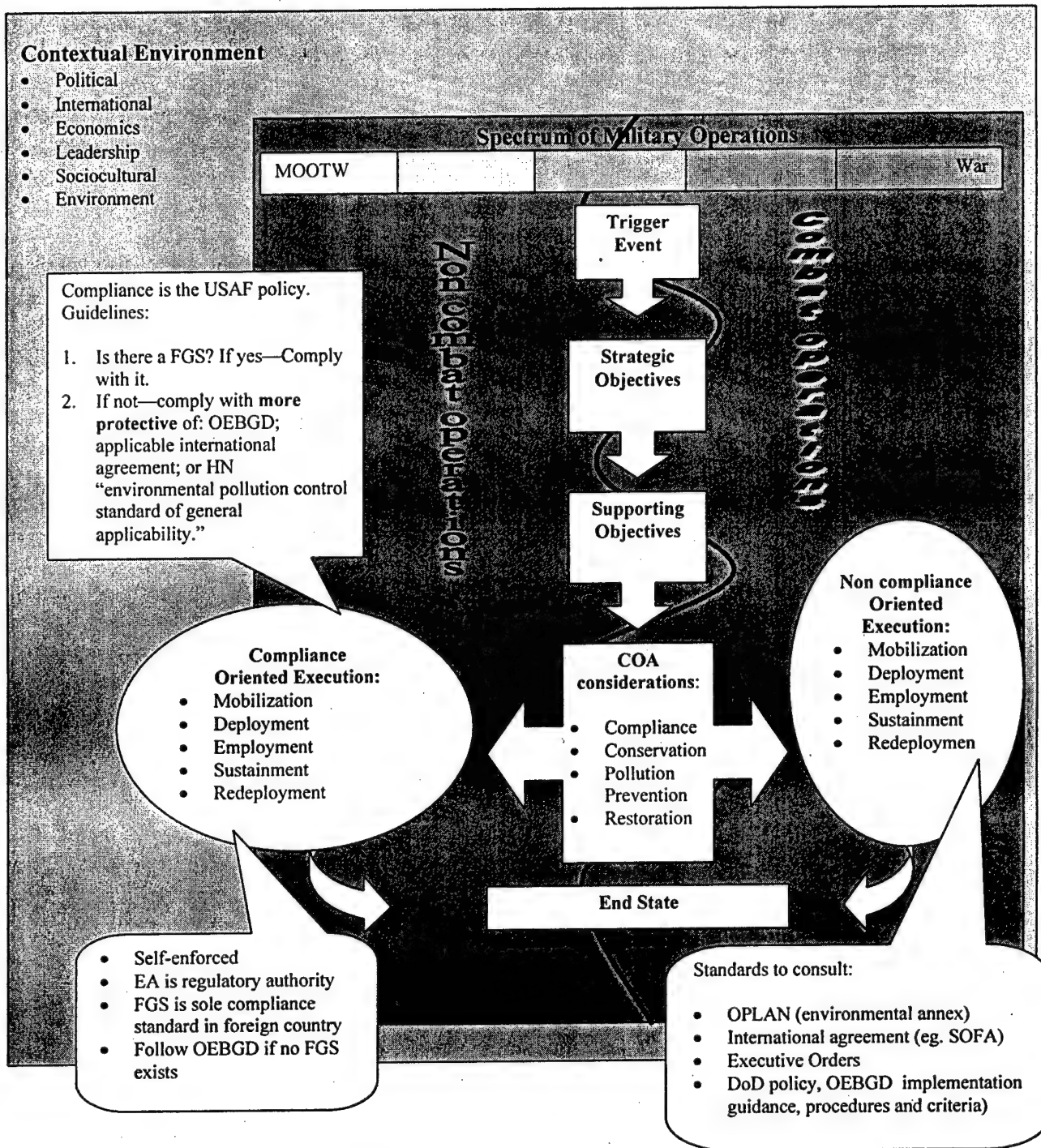


Figure 6. Original ESCOM

Table 3. Original Commander's Environmental Security Checklist

Applicable Phase:					Task	Considerations
Mobilization	Deployment	Employment	Sustainment	Redeployment		
					Note: gray shading indicates which phase of execution applies to this task	
Plan		Implement	Implement/Monitor	Lessons Learned	<p>Work with Deployed CE/Theater Component to identify environmental issues based on:</p> <ul style="list-style-type: none"> Situational awareness—determine context, mission requirements, and spectrum of conflict Legal/political issues: ID governing standards and HN or international agreements in AOR Develop AOR-specific BMP (to ensure human health and environmental protection) 	<p>Critical step—determine mission requirements, legal considerations and situation-unique deployment issues</p> <ul style="list-style-type: none"> Document logic trail Consider capabilities and limitations Consider context
Plan	Plan and execute	Implement	Monitor	Plan and execute	<p>Elements of Environmental Planning (JP 4-04):</p> <ul style="list-style-type: none"> Policies and responsibilities to protect and preserve the environment during the deployment Certification of local water sources by appropriate medical field units Solid and liquid waste management Hazardous material management including the potential use of pesticides Flora and fauna protection Archeological and historical preservation Base field spill plan 	<p>Obtain AOR-specific information. Waste Management issues include:</p> <ul style="list-style-type: none"> Open dumping? Open burning? Disposal of gray water? Disposal of pesticides? Disposal of human waste? Disposal of hazardous waste? <p>The plan must be executed—develop training procedures and execution strategy based on these general planning categories</p>
					<p>Non-DoD installation legal considerations:</p> <ul style="list-style-type: none"> ID req. for compliance, conservation, P2, and restoration Photos (or video)—document environmental conditions before, during and after deployment 	<p>If OPLAN Environmental Annex exists—comply with guidance. Is there a FGS? If not, use the OEBGD and document decision process. Stewardship—if compliance is not mandated, use common sense and implement BMP</p>
ID		Impl			<p>Training</p> <ul style="list-style-type: none"> US forces Host nation or coalition forces 	<p>Identify requirements, develop and implement program.</p>
					Develop risk assessment and plan to manage risk	See Chpt. 8, AFEHCO
Develop	Implement			Lessons Learned	<p>Develop and implement BMP for each specific category:</p> <ul style="list-style-type: none"> Hazardous waste Hazardous material Solid Waste Water (availability, quality, storage, distribution) Spill Prevention Program Air Pollution Natural and Cultural Resource Management Pollution Prevention and Conservation Pesticide (control, use, disposal...) 	<ul style="list-style-type: none"> Determine standards based on legal compliance (OPLAN, FGS or OEBGD), or BMP. Are you deploying with organic capability to manage these issues? If not, who are you relying on and what capabilities (and limitations) do they have? Focus: minimize impacts to human health and the environment without impacting the mission
					Update Environmental Plan	Document lessons learned

Appendix B

List of Experts

This Appendix summarizes who received a copy of the initial Environmental Security Contingency Operations Model (ESCOM) and Commander's Environmental Security Checklist (CESC) for review and comment. The table below identifies the person, their title, expertise, and agency.

Table 4. Distribution Listing—Information Framework Reviewers

<i>Person</i>	<i>Title</i>	<i>Expertise</i>	<i>Agency (level)</i>
Commanders			
Col David O. Swint	Professor and Head, Civil Engineering Department	Commander, Readiness, Education	HQ USAFA/DFCE (DRU)
Col John H. Estes	Civil Engineer (AFSOC)	Commander, Readiness, Education	HQ AFSOC/CE (MAJCOM)
Col Tickel	Civil Engineer (SPACECOM)	Commander	HQ SPACECOM/CE (MAJCOM)
Col Fox	Civil Engineer (USAFE)	Commander	HQ USAFE/CE (MAJCOM)
Col Destadio	Civil Engineer (PACAF)	Commander, Joint Staff	HQ PACAF/CE (MAJCOM)
Lt Col Seely	Environmental Engr	Environmental Engr.	AFCEE (DRU)
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Glossary

ACSC	Air Command and Staff College
AU	Air University
CINC	commander-in-chief
CA	civil affairs
CMOC	civil-military operations center
COA	course of action
DoD	Department of Defense
HN	host nation
HA	humanitarian assistance
JAG	judge advocate general
JCS	Joint Chiefs of Staff
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, chemical
NCA	National Command Authorities
NEO	noncombatant evacuation operations
NGO	nongovernment organization
OOTW	operations other than war
OPLAN	operations plan
OPORD	operations order
OPSEC	operations security
PA	public affairs
PAO	public affairs officer
PDD	Presidential decision directive
PE	peace enforcement
PK	peacekeeping
PVO	private voluntary organization
ROE	rules of engagement
SECDEF	Secretary of Defense
SECSTATE	Secretary of State
SOF	special operations forces
SOFA	status of forces agreement

allocated. Forces authorized by NCA for actual execution of a contingency plan.
(JOPES user's guide)

apportioned. Those forces made available to the CINCs for Chairman-tasked contingency planning through JSCP.

assigned. Those forces placed under the combatant command (COCOM) of a CINC by the Secretary of Defense (SecDef) in his "Forces for Unified Commands" memorandum and are available for normal peacetime operations.

campaign planning. Translation of national and theater strategy into strategic and operational concepts. Campaign plan embodies the CINC's strategic vision of the arrangement of related operations necessary to attain theater strategic objectives. Includes both deliberate and crisis action planning

center of gravity. The hub of all power and movement upon which everything depends; that characteristic, capability, or location from which enemy and friendly forces derive their freedom of action, physical strength, or the will to fight. (FM 100-23)

civil affairs. The activities of a commander that establish, maintain, influence, or exploit relations between military forces and civil authorities, both governmental and nongovernmental, and the civilian population in a friendly, neutral, or hostile area of operations in order to facilitate military operations and consolidate operational objectives. Civil affairs may include performance by military forces of activities and functions normally the responsibility of local government; these activities may also occur, if directed, in the absence of other military operations. (FM 100-23)

civil-military operations. The complex of activities in support of military operations embracing the interaction between the military force and civilian authorities fostering the development of favorable emotions, attitudes, and behavior in neutral, friendly, or hostile groups (FM 100-23).

coalition. An ad hoc agreement between two or more nations for a common action. (FM 100-23)

command. Constitutes the authority to issue orders covering every aspect of military operations and administration; the sole source of legitimacy for US commanders originates from the US constitution, federal law, and the Uniform Code of Military Justice and flows from the President to the lowest US commander in the field; the chain of command, from the President to the lowest commander in the field, remains inviolate. (Presidential Decision Directive 25).

conflict resolution. "The process by which one actor favorably concludes a conflict by reaching a desired end state." "Conflict termination should be considered from the onset of planning and should be refined as the conflict moves toward advantageous termination." (JP 3-0) The process by which one actor favorably concludes a conflict by reaching a desired end state—encompasses war termination.

conflict termination. The process and period during which military forces transition from active combat operations to postconflict activities and from postconflict activities to redeployment. (FM 100-23).

conflict. The period characterized by confrontation and the need to engage in hostilities other than to secure strategic objectives. (FM 100-23).

crisis action planning. Based on current events and conducted in time-sensitive situations and emergencies using assigned, attach, and allocated forces and resources.

deliberate planning. Prepares for a possible contingency based on the best available information and using forces and resources apportioned for deliberate planning by

the JSCP. Relies heavily on assumptions about conditions that will exist when plan is executed; conducted primarily in peacetime.

deployment. Relocation of forces and material to desired areas of operations.

doctrine. Fundamental principles by which military forces guide their actions in support of national objectives; doctrine is authoritative but requires judgment in application. (FM 100-23)

employment. Use of forces in the theater of operations.

end state. Military end state includes the required conditions that, when achieved, attain the strategic objectives or pass the main effort to other instruments of national power to achieve the final strategic end state; that end state describes what the NCA wants the situation to be when operations conclude-both military operations, as well as those where the military is in support of other instruments of national power; in the peace operations context, end state includes the political and military conditions described by the authorizing power as the objective of peace operations. (FM 100-23)

force protection. Security program designed to protect soldiers, civilians employees, family members, facilities, and equipment in all locations and situations; accomplished through planned and integrated application of combating terrorism, physical security, operations security, personal protective services; supported by intelligence, counterintelligence, and other security programs. (FM 100-23)

host nation. A nation that receives the forces and/or supplies of allied nations and/or NATO organizations to be located on, to operate in, or to transit through its territory. (FM 100-23)

host nation support. Civil and/or military assistance rendered by a nation to foreign forces within its territory during peacetime, times of crisis, emergencies, or war; assistance provided during war is based upon agreements mutually concluded between nations. (FM 100-23)

humanitarian assistance. Assistance provided by DoD forces, as directed by appropriate authority, in the aftermath of natural or man-made disasters to help reduce conditions that present a serious threat to life and property; assistance provided by US forces is limited in scope and duration and is designed to supplement efforts of civilian authorities who have primary responsibility for providing such assistance. (FM 100-23)

intelligence. The product resulting from collection, processing, integration, analysis, evaluation, and interpretation of available information concerning foreign countries or areas. (FM 100-23)

joint task force. A force composed of assigned or attached elements of two or more services and constituted by appropriate authority for a specific or limited purpose or missions of short duration. (FM 100-23)

mobilization: mobilization of reserve forces and their movement from home port to port and back

multinational operation. A collective term to describe military actions conducted by forces of two or more nations; typically conducted within structures of coalitions or alliances. (FM 100-23)

multinational. Pertaining to activities of both alliance and coalition organizations. (FM 100-23)

nation assistance. Diplomatic, economic, informational, and military cooperation between the US and the government of another nation, with the objective of promoting internal development and the growth of sustainable institutions within that nation; corrects conditions that cause human suffering and improves the quality of life of the nation's people. (FM 100-23)

nongovernment organization. A professional association, foundation, multinational business or other group with an interest in improving the quality of life of people. (FM 100-23)

operations other than war. Military activities during peacetime and conflict that do not necessarily involve armed clashes between two organized forces. (FM 100-23)

peace operations. An umbrella term that encompasses three types of activities; activities with predominantly diplomatic lead (preventive diplomacy, peacemaking, peace building) and two complementary, predominately military, activities (peacekeeping and peace-enforcement). (FM 100-23)

peace. A high fidelity conflict resolution process (ACSC Research Project). An environment of mutual acceptance of national interests and objectives. According to St Augustine, "Peace in its final sense is the calm that comes of order." (Seabury and Codevilla, pg. 270)

peace-building. Post-conflict actions, predominately diplomatic, that strengthen and rebuild civil infrastructure and institutions in order to avoid a relapse into conflict. (FM 100-23)

peace-enforcement. The application of military force, or the threat of its use, normally pursuant to international authorization, to compel compliance with resolutions or sanctions designed to maintain or restore peace and order. (FM 100-23)

peacekeeping. Military operations undertaken with the consent of all major parties to the dispute, designed to monitor and facilitate implementation of an agreement (cease-fire, truce, etc.) and support diplomatic efforts to reach a long-term political settlement. (FM 100-23)

peacemaking. A process of diplomacy, mediation, negotiation, or other forms of peaceful settlement that arranges ends to disputes and resolves issues that led to conflict. (FM 100-23)

procedures. A standard and detailed course of action that describes how to perform a task. (FM 100-23)

psychological operations. Planned operations to convey selected information and indicators to foreign audiences to influence their emotions, motives, objective reasoning, and, ultimately, the behavior of foreign governments, organizations, groups, and individuals; the purpose is to induce or reinforce foreign attitudes and behavior favorable to the originator's objectives. (FM 100-23)

redeployment. Retrograde of forces and support from the theater of ops to another theater or home station.

rules of engagement. Directives issued by competent military authority that delineate the circumstances and limitations under which US forces will initiate and/or continue combat engagement with other encountered forces. (FM 100-23)

security assistance. Groups of programs authorized by the *Foreign Assistance Act of 1961*, as amended, and the *Arms Export Control Act of 1976*, as amended, or other related statutes by which the United States provides defense articles, military

training, and other defense-related services by grant, loan, credit, or cash sales in furtherance of national policies and objectives. (FM 100-23)

status of forces agreement. An international agreement that demonstrates the legal relationship between the armed services of sending states and the host nation; determines a standard legal treatment and provides a basis for solving legal problems required by the presence of foreign forces abroad. (FM 100-23)

strategy. The art and science of employing the armed forces and other elements of national power during peace, conflict, and war to secure national security. (FM 100-23)

support. Relationships for one force to aid, assist, protect, or logistically support another force; the supporting force gives the needed support to the supported force; establishing supported and supporting relationships among components is a useful option to accomplish needed tasks; this concept applies equally to all dimensions of the joint force organized by the CINC; categories of support include—mutual, general, direct, and close. (FM 100-23)

sustainment. Re-supply of forces.

theater campaigns. Are conducted by joint forces and synthesize mobilization, deployment, employment, sustainment, and their subordinate operations or campaigns into a coherent whole.

total mission awareness. The ability of commanders at all levels to consider everything that affects their operation; applies to operations other than war and war. (FM 100-23)

versatility. The ability of units to meet diverse challenges, shift focus, tailor forces, and move from one role or mission to another rapidly and efficiently. (FM 100-23)

war termination. Is a subset of Conflict Resolution "...planning and executing war termination can cover a lot, from planning before a war starts to the negotiations following a truce." (Bruce C. Bade, Conflict Resolution Coursebook)

war. "War is an extension of Politics with other means." (Clausewitz) A state of open and declared armed hostile conflict between political units such as states or nations; may be limited or general in nature. (FM 100-23)

Bibliography

Here is a list of the Internet sites, books, documents, and periodicals used.

Internet sites

Air Force Center for Environmental Excellence. <http://www.afcee.brooks.af.mil>
Air Force Publications: <http://afpubs.hq.af.mil/elec-products>
AU Library web site. *The Environment and the Military*. Compiled by Diana Simpson.
<http://www.au.af.mil/au/bibs/env/envm.html>. Aug 1997.
DENIX home page. <http://denix.cecer.army.mil/denix>.
DENIX Web site search engine: <http://denix.cecer.army.mil/denix/DOD/Search/more.cgi>.
DoD Environmental Resources. <http://www.dtic.mil/envirodod/dodenvir.html>.
DoD, Office of Environmental Security. *Summary of Congressional Issues*.
[http://www.acq.osd.mil/ens...Program Integration](http://www.acq.osd.mil/ens...Program%20Integration). Oct 1997.
NATO environmental clearinghouse system. <http://chs.ida.org/>
NATO environmental web site. <http://echs.ida.org/general.shtml>
Office of the Deputy Under Secretary of Defense for Environmental Security.
<http://www.acq.osd.mil/ens>.
USAFE/CE Environmental Division. <http://www.usafe.af.mil/direct/ce/cev.htm>

Books

Clawson, Patrick L. *Strategic Assessment 1997: Flashpoints and Force Structure (FFS)*.
Washington DC: Institute for National Strategic Studies, National Defense
University, 1997.
HQ USAF/CEV and AFCESA/CEX. *Air Force Environmental Handbook for
Contingency Operations*. Aug 1996
Hughes, Barry, *Continuity and Change in World Politics*. 2nd Ed. Englewood Cliffs:
Prentice Hall, 1994.
Papp, Daniel S. *Contemporary International Relations*. 4th Ed. New York: MacMillan
College Publishing Co., 1994.
Seabury, Paul and Codevilla, Angello. *War: Ends and Means*. New York: Basic Books
Inc., 1989.
The Chicago Manual of Style. 14th ed. Chicago: The University of Chicago Press, 1993.

Documents

A National Security Strategy for a New Century. The White House: Washington, D.C.,
1997.

Air Force Instruction (AFI) 10-209. *RED HORSE Program*, 20 Apr 1994; on-line, available from: <http://afpubs.hq.af.mil/elec-products>.

AFI 10-210. *PRIME BEEF Program*, 6 Apr 1994; on-line, available from: <http://afpubs.hq.af.mil/elec-products>.

AFI 10-21. *Base Civil Engineer Contingency Response Planning*, 30 Mar 1994; on-line, available from: <http://afpubs.hq.af.mil/elec-products>.

AFPD 32-70 *Environmental Quality*, 20 Jul 1994; on-line, available from: <http://afpubs.hq.af.mil/elec-products>.

Carr, David L., Colonel. *Considerations for the Development of a DoD Environmental Policy for Operations Other Than War*; on-line, available from: <http://aipi.gatech.edu/pubs/carr>. May 1997.

Commander's Guide to Environmental Quality, the Environmental Program in Foreign Countries, 20 Feb 1998; on-line, available from: <http://www.afcee.brooks.af.mil/ec/cmdrguid/>

Department of Defense Directive (DODD) 6050.7. *Subject: Environmental Effects Abroad of Major DoD Actions*. March 1979

DODD 6050.16. *DOD Policy for Establishing and Implementing Environmental Standards at Overseas Installations*.

Joint Warfighting Center. *Joint Task Force (JTF) Commander's Handbook for Peace Operations*. 16 Jun 1997

Military to Military Environmental Conference. *Abstracts of Speaker Presentations*; on-line, available from: <http://echs.ida.org/general.shtml> 12-16 May 1997.

National Military Strategy (NMS) of the United States of America, Shape Respond, Prepare Now: A Military Strategy for a New Era . 1997.

NATO Environmental Web site. *Draft Environmental Guidelines for the Military Sector*; on-line, available from: <http://echs.ida.org/general/general.shtml>. Last update: 13 Dec 1995.

NATO Environmental Web site. *The Challenges of Modern Society (Leaflet Version)*; on-line, available from: <http://echs.ida.org/general/ccms/pub-leaf.html>. Last update: 8 Mar 1996.

Naval Facilities Engineering Service Center. *Navy Commanding Officer's Guide to Environmental Compliance*. Sep 1995; on-line, available from: <http://denix.cecer.army.mil/denix/DOD/Search/more.cgi>.

Operational Law Handbook, International and Operational Law Department, The Judge Advocate General School, US Army, VA, JA422, 1997.

Overseas Environmental Baseline Guidance Document. 1992. on-line. available from <http://denix.cecer.army.mil/denix/DOD/Search/more.cgi>.

Phelps, Richard A., Lt Col. *Environmental Law for Department of Defense Installations Overseas*. 3rd Edition, March 1997; on-line, available from: <http://denix.cecer.army.mil/denix/DOD/Search/more.cgi>.

User's Guide for Joint Operation Planning. 11 September 1994.

Wasserman Goodman, Sherri. *Speech to Army War College*. <http://denix.cecer.army.mil/denix/Public/ES-Programs/Speeches/speech-25.html>.

Weaver, Larry A. and Pollock, Ribert D. *Campaign Planning for the 21st Century: an Effect-Based Approach to the Planning Process*. Reprinted in War Theory Coursebook. Sept 1997.

Joint Publications available from the Joint Electronic Library:

Joint Pub 1-0. Joint Warfare of the Armed Forces of the United States. 10 January 1995.

Joint Pub 1-02. DOD Dictionary of Military and Associated Terms. March 1994

Joint Pub 3-0. Doctrine for Joint Operations. 1 February 1995.

Joint Pub 4-0. Doctrine for Logistic Support of Joint Operations. 27 Jan 95

Joint Pub 4-04. Joint Doctrine for Civil Engineering Support. 26 Sept 1995.

Joint Pub 3-07. Joint Doctrine for Military Operations Other Than War. 16 June 1995.

Joint Pub 5-0. Doctrine for Planning Joint Operations. 13 April 1995

Periodicals

Notar, Charles E. *Operational Doctrine and the Environment.* **Military Review.** 76:101-103. Mar-Apr 1996.

Tierno, Maria-Elena and Matrai, Eva (Lt Col). *Environmental Security in Hungary.* **Military Engineer.** 89:51-52. Oct-Nov 1997.